The Bulletins are published weekly throughout the school year (thirty issues) to aid teachers and students in keeping abreast of geography behind current news events.

GEOGRAPHIC SCHOOL BULLETINS

of

The National Geographic Society

WASHINGTON 6, D. C.

The National Geographic Society is a non-profit educational and scientific Society established for the increase of geographic knowledge and its popular diffusion.

VOLUME XXX — February 4, 1952 — NUMBER 17

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(SEE BULLETIN NO. 3) KIP ROSS

AT 12,000 FEET, LLAMAS AND MEN IN CUSCO, PERU, ARE AMONG EARTH'S HIGHEST INHABITANTS

Bulletin No. 1, February 4, 1952

Typical Bolivian Is Farmer, Not Tin Miner

BECAUSE of the high price of Bolivian tin, United States workers are losing their jobs in a Texas tin smelter operated by a Netherlands company. This international tangle stems from Bolivia's demand of at least $1.50 a pound for tin, and the United States's refusal to go higher than $1.12. The pre-Korean War price was 80¢.

Since World War II, Bolivia has been the world's number-two tin producer, and the western hemisphere leader. From the landlocked South American country comes the coating for millions of North American tin cans.

Indians Don't Speak Spanish

In world circles, Bolivia is thought of primarily in terms of tin and other metals. Yet the tin industry barely scratches the surface of the Andean republic's home life. Only 60,000 of Bolivia's 3,500,000 people are supported by tin. Two-thirds of the people live by farming.

More than half the Bolivians are Indians, a higher proportion than in any other South American country. Most of them cannot read or write, nor even understand Spanish, the language of the small ruling class.

The average "man behind the plow" in Bolivia has never used a telephone or received a piece of mail. Though he has never read a newspaper, he probably has listened to radio. The most positive thing about the *altiplano* farmers is that they live and work at as high an altitude as any other people on earth.

Most Bolivians inhabit the altiplano, a plateau ranging from 11,500 to 15,000 feet above sea level. This high plain is rimmed and ribboned by mountain ranges extending an additional 6,000 feet into the clouds. Indians mine tin at 15,000 feet, higher than any point in the United States. At altitudes which make visitors gasp for breath, native farmers "with bellows for lungs" work all day in the fields.

Titicaca Is Highest Navigable Water

Bolivia's five first cities lie at least 8,000 feet above the sea. Its capital, La Paz, is the highest in the world, at 12,000 feet. This is twice as high as Denver, Colorado. The 1946 census counted more than 300,000 inhabitants.

La Paz is near Lake Titicaca, the highest navigable water in the world. On the boundary between Peru and Bolivia, this lake marks the northern end of the latter's altiplano. It is more than half as large as Connecticut, and steamers ply its waters.

The lake, absorbing and holding heat from the sun, warms the surrounding basin so that wheat may be grown at 12,800 feet. Other crops include corn, barley, alfalfa, sugar cane, vanilla, fruits, and coffee. Production of rubber and cinchona bark (for quinine) was revived by World War II.

East of the mountains, Bolivia includes a vast area of the Amazon basin. This is jungle lowland, almost uninhabited, sweltering and damp.

ENTERED AS SECOND CLASS MATTER APRIL 27, 1943, POST OFFICE, WASHINGTON, D. C., UNDER ACT OF MARCH 3, 1879.
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B. ANTHONY STEWART

ON A ROCKY HILLOCK, TWO WYOMING RANCH GIRLS HALT THEIR HORSES TO SURVEY THE PADDOCKS AND PASTURES OF THEIR HOME ACRES

Set in the heart of the almost-legendary "Wild West," this Hereford ranch is a model of its kind. With its huge barns and cowsheds, towering silos and windmills, and dozens of dwellings, it is a complete community. Its highly pedigreed stock has helped to build up better herds wherever cattle raising is a science as well as a business. A ranch like this is a perfect laboratory for the young member of a 4-H club (Bulletin No. 4) who chooses cattle breeding as a career.

Dismal Swamp Still Wild and Little Changed

WHEN the first English colonists in America stepped ashore at Roanoke Island, North Carolina, and Jamestown, Virginia, they settled on either side of a vast watery wilderness which came to be known as the Dismal Swamp. As more and more settlers arrived, colonies became states and near-by towns grew into cities, but always the dank morass of the swamp was avoided.

Today, the "Great Dismal," situated immediately south of Norfolk, Virginia, still is virtually uninhabited. It is nearly as wild as ever (illustration, next page). One of the few remaining natural kingdoms in the eastern United States, its spongy forestlands sprawl across half a million acres in seven counties and two states.

'Coons, Snakes, and Bears

Ax, drainage ditch, and plow have shrunk the Dismal by a third since colonial days. But botanists and foresters still describe its gloomy heart, almost half the size of Delaware, as the finest outdoor laboratory of its kind on the continent, a "relict area" which holds a natural, undisturbed plant community.

The swamp is the kingdom of raccoons and otters, poisonous snakes and bears, wild ducks and deer. It has a permanent population of one family, and many a legend of lawlessness from its past.

Escaped slaves, fugitives, and "moonshiners" hiding out in its depths built a lasting reputation for mystery and danger matching the Dismal's quicksands, its tangled thickets and brush-choked "lights," its dark, sponge-wet bottoms.

More than half the swamp, including its least-explored regions, lie in North Carolina, but lonely Lake Drummond, three miles long by two and a half miles wide, is entirely within Virginia. Oddly enough, the surface of the lake is as much as ten feet above the surrounding swamp, which slopes away from the lake's leaky rim like an inverted saucer.

Only One Habitation

George Washington and Patrick Henry were among the swamp's first landowners, investing in its gums, cypress, maple, and southern white cedar. Lumber companies cut canals and ditches, one bearing Washington's name, to bring out the timber. These narrow waterways still offer the only access to the heart of the swamp. But today the George Washington Highway (U. S. Route 17) skirts the Dismal's eastern edge. An engineer described it as "all water and no bridges" before the road was hard-surfaced in the 1920's.

The only permanent human habitation in the Lake Drummond wilderness is the house of the government-employed lock tender at the Waste Weir gates, which control the flow of water into the Dismal Swamp Canal.

This link in the Intracoastal Waterway connects Hampton Roads, at Portsmouth, Virginia, with the Pasquotank River and Albemarle Sound. Twenty-two miles long and 50 feet wide, with ten feet of water over its

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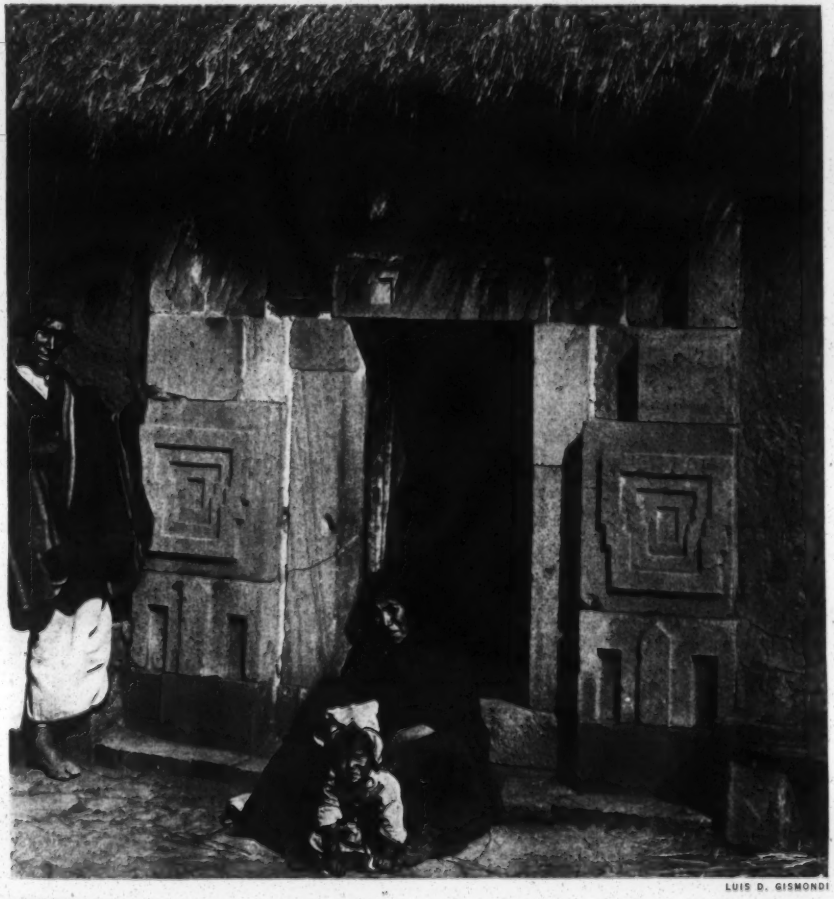
Altogether, the country equals nearly two Texases in size and half a Texas in population.

Silver mines attracted the Spaniards to Bolivia in the 1500's. Potosí had a boom like that of San Francisco three centuries later. Its population reached 160,000. Near-by Sucre also experienced a silver rush. Today, it is the nominal capital, but the only government branch located there is the supreme court. La Paz holds all other government offices and functions and is the actual capital.

NOTE: Bolivia may be located on the National Geographic Society's map of South America. Write the Society's headquarters, Washington 6, D. C., for a price list of maps.

For additional information, see "Sky-high Bolivia" (20 color photographs), and "Puya, the Pineapple's Andean Ancestor," in the *National Geographic Magazine* for October, 1950; "Bolivia—Tin Roof of the Andes," March, 1943; "Tin, the Cinderella Metal," November, 1940; "Bolivia, Land of Fiestas," November, 1934 (out of print; refer to your library); and "Heart of Aymará Land," February, 1927. *(Back issues of the Magazine may be obtained from the Society's headquarters at 60¢ a copy, 1946 to date; $1.00, 1930-1945; and $2.00, 1912-1929. Earlier issues, when available, at varied prices.)*



LUIS D. GISMONDI

PRE-INCA STONES AND BARLEY-THATCH ROOF COMBINE TO MAKE A HOME FOR A BOLIVIAN FAMILY

Bulletin No. 3, February 4, 1952

Animals, Insects Live Far above Timber Line

FOUR miles high and more, the earth's loftiest permanent inhabitants are small black spiders that eat each other to stay alive.

These are the known champions in life's grimmest battle for survival. They struggle against thin air and bitter cold, against snow, ice, and barren rock, on the storm-swept slopes of the world's highest mountains, the Himalayas of Nepal and Tibet.

Abominable Snowmen?

Altitude chokes off human settlement and then vegetation, before animals and insects give up the struggle. Scientists who have returned from attempting to climb 29,002-foot Mount Everest tell of tiny cannibalistic spiders hopping from ice crevices and rock niches at 22,000 to 23,000 feet. There the atmospheric pressure is less than half that at sea level. All plant life stops 4,000 feet below, and permanent human habitation ceases 8,000 feet below.

No one knows what makes the great splayed footprints in the snow which several Everest expeditions have seen high above the tree line. Tibetan porters and the Sherpa tribesmen of the Himalayas ascribe them to the feared "Metch kangmi"—translated by British mountaineers as "Abominable snowmen," a 30-year-old Everest legend.

Whatever the fact or fancy of such unknown mountain creatures, animals do exist near or above the line of permanent snow in the mighty Himalayas. These include the ghostly snow leopard, the Asiatic mountain goats—ibex, markhor, serow, and tahr—and the bharal, wild sheep with heavy, down-curving horns.

There are Himalayan red bears (*Ursus arctus*) which hibernate through the winters; wild, shaggy yaks in the most inaccessible reaches of the mountains; marmots, Tibetan hares, and burrowing pikas that resemble small furry guinea pigs; raccoonlike pandas and even slender, long-legged monkeys known as langurs.

Llamas, Bighorn Sheep, and Gorillas

Even higher, zoologists have found bees, moths, grasshoppers, and butterflies. Birds exist on dead grasses blown among the rocks and lichens growing on stone.

In the Andes ranges of South America live the lamoids, a branch of the camel family which includes the llamas (illustration, cover), alpacas, guanacos, and vicuñas. The thinner the air the better these "camels of the clouds" seem to like it.

Rocky Mountain bighorn sheep come down from their lofty crags only when forced by heavy winter snowdrifts (illustration, next page). On the other side of the world the slopes of snow-capped mountains in the Belgian Congo are the home of the last remaining mountain gorillas.

Man has never reached the peak of Mount Everest, but from what he has seen of other high mountaintops he knows that only the summits of the highest crags are free of all kinds of life. And wherever he has

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lock sills, the canal is maintained by the United States Army Engineers.

Fire has left far greater scars in the Dismal than has the lumberjack. Because of the thick peat which floors the forest, the ground itself will burn in dry years. Smoke billowing from the swamp has been known to halt traffic and obscure military airfields in Norfolk. Swamp-fire smoke slowed coastal shipping and gave cover to U-boats during the war.

A hamlet known as "Dismal Town" once stood in the swamp, but it has long since disappeared. About 1850 there was also a hotel built by Lake Drummond to accommodate hunting and fishing parties.

Water in the Dismal's ditches and cypress-fringed lake is stained to the color of dark cider by submerged peat and twisted roots and stumps. In the days of sailing ships, "juniper water" from the Dismal was barreled and carried around the world, for it did not go foul as quickly as ordinary water.

Several times state officials and interested conservationists have urged the federal government to turn the Dismal Swamp into a national forest for increased protection. To date, their efforts have been unsuccessful.

NOTE: The Dismal Swamp may be located on the Society's map of the Southeastern United States, on which the area appears in a large-scale inset.

For further information, see "Roads from Washington," in the *National Geographic Magazine* for July, 1938; "Dismal Swamp in Legend and History," July, 1932 (out of print; refer to your library); and "Virginia—a Commonwealth That Has Come Back," April, 1929.

H. W. GILLEN

BOATMEN ON WASHINGTON DITCH PENETRATE THE MYSTERIES OF DISMAL SWAMP

Near here, Lake Drummond stands at a higher elevation than its surroundings. Canals, or ditches, radiate from it to the edges of the swamp, making for easy access by boat to all parts of this Virginia-North Carolina wilderness. Even if drained and cleared, Dismal Swamp could not be farmed. Its "soil" is a spongy peat formed of decayed and decaying vegetation.

Bulletin No. 4, February 4, 1952

New Stamp Honors 4-H Clubs' Enterprise

SINCE the Children's Crusade set out to free Jerusalem from infidels, the world has seen many youth movements. None has been quite in a class with the 4-H Clubs of the United States. The 50th birthday of these clubs is commemorated with a new postage stamp which made its first appearance at Springfield, Ohio, on January 15.

This 3¢ green stamp is the size of a special delivery one. It shows a farm scene, a teen-age boy and girl, the four-leaf-clover symbol of 4-H, and the clubs' motto, "Make the Best Better."

Studied Farm Problems

In 1900, a group of 500 boys in Macoupin County, Illinois, banded together to plant seed corn and produce a crop for exhibit at a local farmers' institute meeting. However, the first agricultural club for young people resembling the present 4-H clubs was organized in the Springfield, Ohio, region on January 15, 1902. A. B. Graham, a school superintendent of Clark County, of which Springfield is the county seat, formed an agricultural club for boys and girls. The members raised vegetables, corn, and flowers, and made soil tests. At regular meetings they presented programs dealing with farm problems.

In 1905, the Ohio clubs, of which several had been formed by that time, joined in a state organization. The United States Department of Agriculture took an interest in the movement and encouraged it, particularly in Mississippi and other southern states. There two-crop farming had been customary—cotton and tobacco—and the clubs demonstrated that it was more profitable to grow a variety.

The idea caught on quickly. The Department of Agriculture appointed leaders to form clubs all over the country. In 1914 an act of Congress established a program, providing funds to help organize clubs. Each state set up a club department. In the 1920's the name was changed from "Boys and Girls Club Work" to "Boys and Girls 4-H Clubs."

Thousands Give Free Service to Clubs

Today the clubs number nearly 90,000. More than 2,000,000 boys and girls between 10 and 21 now are active members. In the past half century the clubs have trained more than 15,000,000 youngsters.

The land-grant colleges' extension services and some 9,000 county agricultural and home-demonstration agents supervise the clubs. Nearly 300,000 men and women serve without pay in leading 4-H Club activities.

Many individuals and corporations also help support the work. They give awards ranging from scholarships, breeding stock, and farm implements to gold medals, cash prizes, and free trips to state fairs and 4-H conventions.

When a member joins a club, he pledges: "My head to clearer thinking, My heart to greater loyalty, My hands to larger service, My health to better living, For my club, my community, and my country." These are the Four H's—one for each leaf of the clover symbol.

A member chooses one or more projects for his training job. Girls

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climbed, no matter how high, there usually has been some form of bird life to look down on him and laugh at his earth-bound efforts.

NOTE: The world's highest mountain peaks may be located on the Society's World Map, on which their heights are noted.

See also, "High Country of Colorado," in the *National Geographic Magazine*, July, 1946; "Peaks and Parks of Western Canada" (11 photographs), October, 1941 (out of print; refer to your library); "Lords of the Rockies" and "Stalking Big Game with Color Camera" (28 color photographs), July, 1939; "With Wild Animals in the Rockies," August, 1935 (out of print); and "Aërial Conquest of Everest," August, 1933.

© WENDELL CHAPMAN

ELECTRIC PEAK IN YELLOWSTONE NATIONAL PARK FRAMES A PAIR OF ROCKY MOUNTAIN SHEEP

Known as bighorns because of the heavy, back-curving horns of the male, these wild North American sheep range from British Columbia south to the Mexican border. They are most at home among the highest crags. A severe storm drove these two sheep down into open country.

Every other day for more than two years, a specially fitted B-29 of the U. S. Air Weather Service has taken off from Alaska for the North Pole. Wheeling over the point which the world's explorers struggled for centuries to reach on foot, the plane makes the 17-hour flight today merely as a matter of routine.

So forceful is the great Orinoco River in Venezuela that where it flows through the so-called Angostura constriction at Ciudad Bolívar, the channel has been scoured out over the centuries to a depth of 262 feet below sea level. Rushing between banks only 800 yards apart, the river has a mean depth of 335 feet, with fluctuations of as much as 52 feet.

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Bulletin No. 5, February 4, 1952

Atom Researchers Seek Travancore's Sand

"A PLACE where the goddess of prosperity dwells" may soon become a true description of Travancore, the region of India whose name means just that.

For 100 miles along the Arabian Sea, Travancore's beach sands are rich in monazite. This mineral is so greatly in demand in the United States that attempts were made in Congress to require shipments of it as part payment for last year's wheat loan to India. Monazite contains thorium, which, like uranium, is a "raw material" for atomic energy.

On Ancient and Modern Trade Routes

Travancore is situated at the southern end of India's Malabar Coast. It contains the southernmost tip of the Indian peninsula—Cape Comorin. Shut off from the rest of the peninsula by a jungle-covered chain of mountains—the Western Ghats—the state is crisscrossed by dozens of rivers, lakes, and canals, and has many good natural harbors.

The Phoenicians were probably the first traders to come to Travancore. They were followed by merchantmen of Greece and Rome. In modern times traders from Portugal, the Netherlands, and England competed for the copra, teakwood, and coir rope produced in this fertile region.

Under the Republic of India's 1949 constitution, Travancore now is merged with Cochin, a smaller state to the north. The 39-year-old Maharaja of Travancore, Bala Rama Varma, is titular ruler of the combined area, which has more than 9,000,000 inhabitants. The state is a stronghold of communism in India; communists hold only slightly fewer assembly seats than the government party.

Deposits of monazite were discovered near the town of Colachel about 1907 and an extracting plant was established. At that time, Brazil was the world's only large-scale exporter of the mineral.

Colachel sands were worked by a sluicing operation similar to the washing of gold. Grains of monazite were then separated electromagnetically from zircon and ilmenite. The product was shipped to Hamburg, Germany, and until 1934, Travancore's monazite, representing 75 per cent of the world's supply, was controlled by Germans.

Thorium Once Used in Gas Mantles

Originally, the thorium extracted from monazite was used in the manufacture of incandescent gas mantles. After World War I, the decline in gas-lighting fixtures brought a halt to monazite mining. Another mineral, ilmenite, also present in the Travancore sands, was found to be valuable in paint manufacture, and production switched to ilmenite.

The United States Atomic Energy Commission in 1946 listed thorium as a potential source of fissionable material, although its usefulness at that time was said to be limited to research.

In April, 1946, India placed an embargo on the export of monazite sands, and the Indian Atomic Energy Commission, created in 1948, later authorized the construction of a factory for production of thorium at the town of Alwaye.

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usually select baking, canning, sewing, or home furnishing. A boy or girl may grow vegetables, fruit, or grain; or raise a calf, pig, lamb, or poultry. Some members specialize in forestry, cattle raising (illustration, inside cover), soil conservation, or wildlife protection.

Volunteer leaders help members to carry through the projects, to think logically, to speak in public, and to enter contests. 4-H exhibits are a top attraction at state fairs. On many state fairgrounds, 4-H members have their own exhibit buildings.

The value of controlling soil erosion is now fully appreciated, and is a steady job for farm boys. They ditch, terrace, lay drain pipes, seed old fields to grass, fill up gullies, and build ponds and dams.

How to protect wildlife is taught at 4-H camps. The work ranges from halting erosion to feeding quail. It teaches that many wild creatures—even hawks, gulls, foxes, and snakes—do more good than harm. Rat-killing is so important that worth-while prizes reward it. Rats eat about 200,000,000 bushels of grain a year in the United States.

Each June, groups of 4-H youngsters visit Washington to see the government at work. Some camp beside the Potomac, others stay at hotels. Of particular interest to the young sight-seers is the Agricultural Research Center at near-by Beltsville, Maryland, where important scientific farm experiments are constantly being made.

NOTE: For further information, see "Four-H Boys and Girls Grow More Food," in the *National Geographic Magazine* for November, 1948; and articles listed under "Agriculture" in the *Cumulative Index to the National Geographic Magazine*, in your library.

J. BAYLOR ROBERTS

GONE ARE THE DAYS WHEN A HEN HAD TO SCRATCH AROUND THE FARMYARD FOR A LIVING

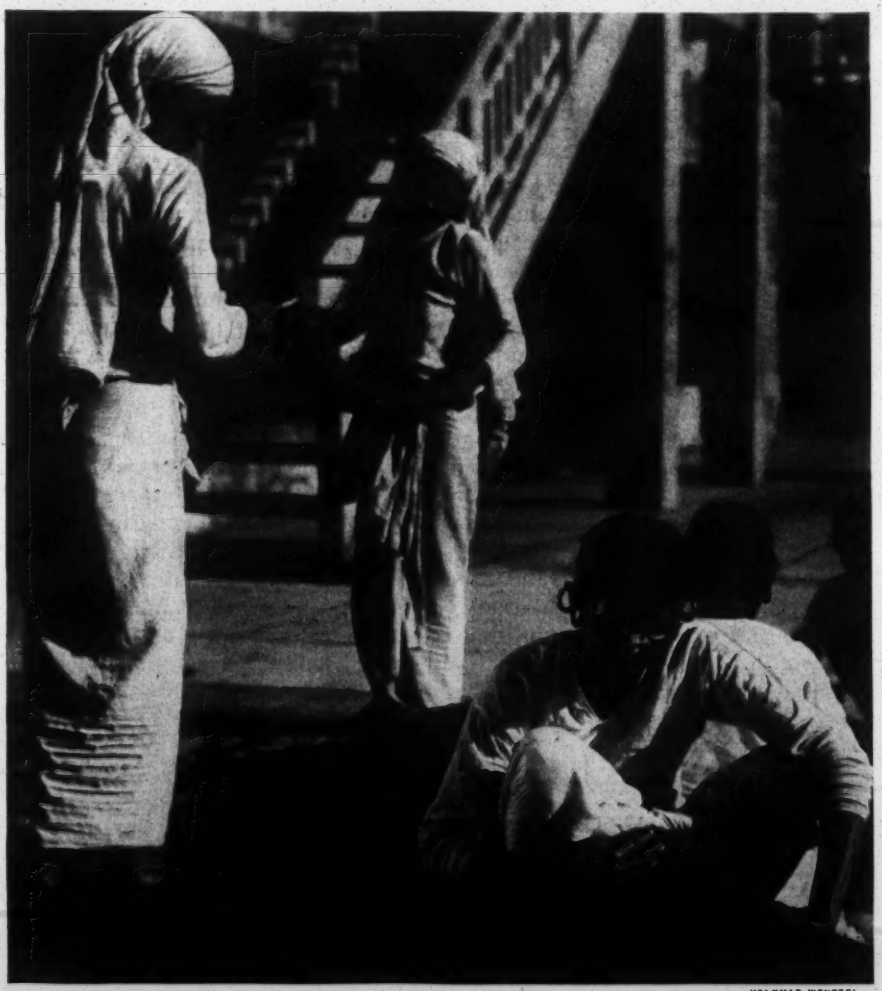
Along with other useful information, 4-H'ers learn the proper care and feeding of chickens. To raise poultry of superior quality, farmers provide their chickens with well-planned meals. This Iowa farm girl draws around her a fine flock—most of them barred Plymouth Rocks—as she serves dinner.

Monazite has been found in the Urals, Siberia, Finland, the United States, Colombia, Brazil, New South Wales, and Quebec. Small quantities have been taken from North Carolina and Florida.

Efforts to locate United States sources have been speeded in recent years. The University of Idaho has conducted experiments in the chemical separation and purification of the rare-earth metals from Idaho monazite, using ion-exchange methods. In two counties lie an estimated 200,000,000 cubic yards of gravel containing 0.2 to 0.3 per cent monazite.

NOTE: Travancore (in the Madras States) may be located on the Society's map of India and Burma.

For additional information on the region, see "India Mosaic" and "India's Treasures Helped the Allies," in the *National Geographic Magazine* for April, 1946.



VOLKMAR WENTZEL

MUCH OF THE PEPPER ON UNITED STATES TABLES COMES FROM TRAVANCORE-COCHIN

At the port of Cochin, women sift and sort out the bad berries. The rest are put in bags and shipped to mills where grinding gives the condiment its familiar form.